



Maryland Smart Energy Communities



Maryland Energy
ADMINISTRATION
Powering Maryland's Future

Petroleum Consumption Reduction Plan

September 12, 2013 Webinar

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Agenda

- ▣ Overview of the Petroleum Consumption Reduction Plan (PCRP)
- ▣ Step-by-step process for constructing a PCRP
- ▣ Sample scenarios and simple analysis
- ▣ Summary of the PCRP process and important notes

PCRP – Five Components*

- 1 – Letters of approval for PCRP from Council
- 2 – Executive Summary of baseline, goal, and plans
- 3 – Narrative describing petroleum baseline
- 4 – Narrative describing goal, existing petroleum reduction projects and plans to expand over the next five years
- 5 – References

In most cases, this is already complete.

Area of focus.

* These five components are guidelines for how to design and package the PCRP. We are very flexible on this point...

Part 4 – Constructing the PCR

■ IV. PETROLEUM CONSUMPTION REDUCTION PLAN

■ Narrative Summary

- 1. Overview of Goals for Years 1-3
- 2. Overview of Goals for Years 4-5
- 3. Identify Areas of Least Efficiency/Greatest Waste
 - *Least efficient and oldest vehicles*

■ Getting to a 20% Petroleum Consumption Reduction Within the 5 Year Period Following the Baseline Year

- Program Management Plan for Implementation, Monitoring and Oversight
- Summary of Projected Fuel Savings

Baseline: Precursor to a PCRP

▣ Establish petroleum consumption baseline

- ▣ All values need to be presented in volume, i.e.
GGE = Gallons of Gasoline Equivalent
- ▣ The conversion factor for vehicles that run on diesel is 1.13.
 - ▣ i.e. Diesel Vehicle, e.g., 998 gallons per year = 1,127 gallons of gasoline.

Type	Vehicle Make	Model	Model Year	Miles Driven (Base year)	Total Vehicle Miles	Trans. Type	Fuel Type Used	Vehicle Purpose	GGE Consumed
Van	Ford	E-250	2007	2,095	9,231	automatic	DIESEL	DPW	331
Extended Cab Pickup	Chevrolet	K-2500	1998	2,664	102,018	automatic	DIESEL	DPW	368
Crew Cab Dump Truck	Chevrolet	C-8500	2002	4,837	34,495	standard	DIESEL	DPW	1,127
TOTAL GGE									1,826

Part 4 – Constructing the PCR

- Step 1: Determine the amount of petroleum reduction needed.
 - $= (0.20) \times \text{baseline petroleum consumption}$
 - E.g., $= (0.20) \times 100,000 \text{ gallons} = 20,000 \text{ gallons within 5 years of baseline}$
- Step 2: For communities that selected earlier baselines, determine the volume difference between the baseline and current petroleum consumption gallons.
 - Take credit for reductions that occurred after the baseline!
 - $= (0.20) \times \text{baseline consumption gallons (reduction goal)} -$
 $(\text{baseline consumption} - \text{existing consumption})$ (current savings)
 $= \text{existing consumption} - [(0.80) \times \text{baseline consumption}]$
or the amount of additional reductions that needs to occur
 - E.g., Community has baseline year of 2010 and consumed 100,000 gallons. If 2012 baseline shows only 88,000 gallons were consumed, then 12,000 gallons can be shaved off the goal and only 8,000 gallons of savings are needed

Sample analysis

Vehicles		Total Gallons Consumed	Total GGE Consumed
Unleaded	379	240,962	240,962
Diesel	214	170,614	192,794
Baseline 2010 GGE			433,756
20 % target reduction by 2016			86,751
Year 2012 GGE			411,606
Reductions (2010 GGE – 2012 GGE)			22,150
Remaining Reductions (GGE)			64,601

- If unsure of vehicle specifications, request information from vehicle manufacturers. For information on the vehicle fuel economy use EPA's tool: <http://www.fueleconomy.gov/feg/findacar.shtml>

Constructing the PCRCP

- **Step 3:** Identify appropriate Petroleum Reduction Measures based upon knowledge of the vehicle fleet
 - By targeting the least efficient vehicles first as part of a retirement/replacement strategy, fewer total vehicles will need to be addressed.
- Also, the Department of Energy's Petroleum Reduction Planning Tool @ <http://www.afdc.energy.gov/prep/> gives estimated savings for:
 - Replacing vehicles
 - Fuel switching
 - Reducing idling
 - Reducing mileage
 - Driving efficiently

Constructing the PCRCP

- **Step 4:** Matching fleet modifications with your community
 - What type of vehicle usage is your community interested in?
 - What are the least fuel efficient vehicles? Where is fuel being needlessly wasted?
 - i.e. public transportation vehicles, dump trucks, older vehicles
 - What is the most cost effective technology given this context?

Project Idea 1

- **Recommendation:** Convert diesel fuel to a 20 percent bio-diesel blend (B20) in the summer months and a 5 percent bio-diesel blend (B5) in the winter months beginning summer
- Using one of the diesel trucks from our baseline example and using the DOE and EPA resources we can generate the following:

Type	Fuel Type Used	GGE Consumed	Miles Driven (Base year)	Winter / Summer Miles*	Summer Fuel Savings (Diesel)	Winter Fuel Savings (Diesel)	Fuel Savings (Diesel)	Total GGE Savings
Crew Cab Dump Truck	DIESEL	1,127.74	4,837	2,418.5	85	21	106	119.78

* Assumes vehicle miles are same in winter and summer

Project Idea 2

- **Recommendation:** *Purchase gasoline/electric hybrid sedans and light trucks when vehicles are replaced.*
- Below is a table of estimated fuel savings from switching from conventional vehicle types to hybrid alternatives:

Vehicle Type	Conventional	MPG	Hybrid Alternative	MPG	Annual Fuel Saved (Gals)*
Compact Sedan	Chevrolet Cobalt	22	Honda Civic	40	307
Mid-sized Sedan	Chevrolet Malibu (non-hybrid)	22	Chevrolet Malibu	27	126
SUV	Ford Escape	23	Ford Escape FWD	32	183
Pick-up Truck	Ford F150 2WD	17	Chevrolet Silverado 2WD	21	168

*Credit to Frederick County: Table Comes from Frederick County Comprehensive Plan

Finalizing the Project Ideas

■ Step 5: Demonstrate planned projects achieve target

Project/ Type	Projected Annual Fuel Savings (gallons)		Total Fuel Diesel Consumed (baseline - diesel gallons)	998 (diesel) 1,128 (GGE)
B20/B5 Fuel Use	120		Total Fuel Consumed (baseline - gas gallons)	4,400
Hybrid Vehicle Replacement	307		GGE Baseline	5,528
No Idling Policy	TBD		Reduction Target (GGE)	4,422
TOTAL	427		20 %	1,106

All projects total ~427 gallons of annual reductions, which is less than 20% of baseline =~1,106. This means additional future projects will need to generate 679 GGE in fuel reductions.

Constructing the PCRFP (cont.)

- **Step 6:** Consider project Implementation
 - status/projected timeline
 - projected fuel savings (gallons)
 - projected cost savings
 - projected total cost
 - any external incentives received
 - any planned use of Maryland Smart Energy Communities grant funds, if designated
 - for measures requiring additional funding, please list the funding source, i.e. capital budget, operating budget, other grants, etc.

Implementation Table

Project/ Type	Status	Projected Annual Petroleum Savings (GGE)	Projected Annual Cost Savings (\$)	Total Installed Cost (\$)	External Incentives (\$)	Net Cost (\$)	Funding Source(s) for Net Costs	Source for Projected Savings
B20/B5 Fuel Use	Approved	119.78	2.39	0	0	0	Capital	www.afdc.energy.gov/fuels/prices.html
Hybrid Vehicle Replace	FY2014	307	1,053.01	25,000	0	25,000	Grant/ Capital	www.fueleconomy.gov
No Idling Policy	FY2014	TBD	TBD	0	0	0	0	n/a

Parts 4 & 5 – Constructing the PCRCP

- **Step 7:** Once all of the information is collected and calculated, write the narrative summary and implementation plan for five years (and beyond).

Part 5 - List of Resources

- Be sure to include all calculations, websites, documents, and outside tools.
- State references and assumptions for each petroleum reduction calculation.

Summary and Important Notes

- ▣ We are very flexible about how communities package and design their planning documents. This presentation and the guidance documents serve mostly as a template.
- ▣ We are looking for a few key components though:
 - ▣ Some thoughtful, quantitative analysis about how to reduce petroleum consumption
 - ▣ Consideration of potential projects and estimated cost & fuel savings
 - ▣ Implementation pieces such as financing ideas and staff responsibilities
 - ▣ Approval from an executive strengthens the plan
- ▣ We recognize communities will not have all project details at this point and commitment to specific projects is difficult.
 - ▣ As a guiding principle, the more effort and collaboration put into the planning, the better the chances of meeting the goals. We want communities to meet the goals.
- ▣ Treat the action plan as a living document that will be updated when more information is available in future years, while making a good-faith effort now.